PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

C mmissioner
US Department of Commerce
United States Patent and Trademark Office, PCT
2011 South Clark Place Room CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 18 January 2001 (18.01.01)	
International application No. PCT/US99/23008	**Applicant's or agent's file reference** Y0998-392P
International filing date (day/month/year) 01 October 1999 (01.10.99)	**Priority date** (day/month/year) 02 October 1998 (02.10.98)
Applicant GOPALAKRISHNAN, Ponani et al	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

02 May 2000 (02.05.00)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer A. Karkachi
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

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From the INTERNATIONAL BUREAU

To:

DEROSA, Frank, V.
F. Chau & Associates, LLP
1900 Hempstead Turnpike
Suite 501
East Meadow, NY 11554
ETATS-UNIS D'AMERIQUE

NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92bis.1 and Administrative Instructions, Section 422)

Date of mailing (day/month/year) 18 January 2001 (18.01.01)	
Applicant's or agent's file reference Y0998-392P	**IMPORTANT NOTIFICATION**
International application No. PCT/US99/23008	**International filing date** (day/month/year) 01 October 1999 (01.10.99)

1. The following indications appeared on record concerning:

[ ] the applicant [ ] the inventor [X] the agent [ ] the common representative

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State of Residence:
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2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

[X] the person [X] the name [X] the address [ ] the nationality [ ] the residence

Name and Address

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State of Residence:
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3. Further observations, if necessary:
The new agent's address on the Demand has been considered as a change under Rule 92bis. In case of disagreement, the International Bureau should be notified immediately.

4. A copy of this notification has been sent to:

[X] the receiving Office
[ ] the International Searching Authority
[X] the International Preliminary Examining Authority
[ ] the designated Offices concerned
[X] the elected Offices concerned
[ ] other:

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland** Facsimile No.: (41-22) 740.14.35	Authorized officer A. Karkachi Telephone No.: (41-22) 338.83.38

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International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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A3

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60/102,957	2 October 1998 (02.10.98)	US
60/117,595	27 January 1999 (27.01.99)	US

(71) Applicant *(for all designated States except US)*: INTERNATIONAL BUSINESS MACHINES CORPORATION [US/US]; Old Orchard Road, Armonk, NY 10504 (US).

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(81) Designated States: CA, CN, IL, IN, JP, KR, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

Published

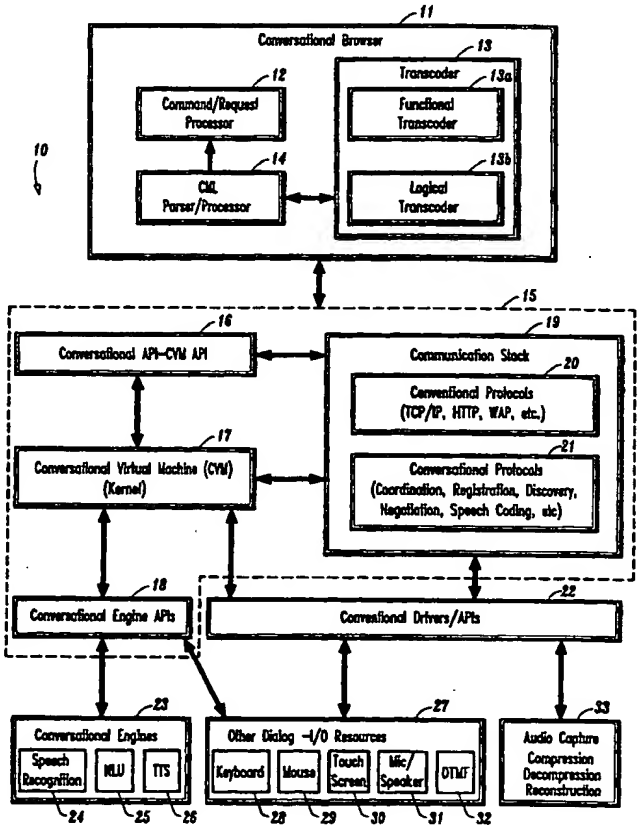
With international search report.

(88) Date of publication of the international search report: 2 November 2000 (02.11.00)

(54) Title: CONVERSATIONAL BROWSER AND CONVERSATIONAL SYSTEMS

(57) Abstract

A conversational browsing system (10) comprising a conversational browser (11) having a command and control interface (12) for converting speech commands or multi-modal input from I/O resources (27) into navigation request. The system (10) comprises conversational engines (23) for decoding input commands for interpretation by the command and control interface and decoding meta-information provided by the CML processor for generating synthesized audio output. The system includes a communication stack (19) for transmitting the navigation request to a content server and receiving a CML file from the content server based on the navigation request. A conversational transcoder (13) transforms presentation material from one modality to a conversational modality. The transcoder (13) includes a functional transcoder (13a) to transform a page of GUI to a page of CUI (conversational user interface) and a logical transcoder (13b) to transform business logic of an application, transaction or site into an acceptable dialog.



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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/23008

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06F 15/16
US CL : 709/201; 709/219

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 709/201; 709/219

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EAST; WEST; MSDN; DR DOBBS; IEEE; ACM; DIALOG

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y, P	US 5,884,262 A (WISE ET AL) 16 MARCH 1999, col. 5, line 29 - col. 7, line 27.	1-22
Y	US 5,799,063 A (KRANE) 25 AUGUST 1998, all	1-22
Y	ZUE, VICTOR W. et al. "NAVIGATING THE INFORMATION SUPERHIGHWAY USING SPOKEN LANGUAGE INTERFACES" OCTOBER 1995, pages 39-43, especially pg. 41.	1-22
A, E	US 5,987,102 A (ELLIOTT ET AL) 16 NOVEMBER 1999	1, 14, 19
A, P	RASH, WAYNE et al. "HANDS-FREE SURFING", Internetweek, 25 MAY 1998, pg. 1-2, n. 716	1, 14, 19

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

*	Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 23 MAY 2000	Date of mailing of the international search report 26 JUL 2000
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer ALVIN OBERLEY Joni Hill Telephone No. (703) 305-9716

Form PCT/ISA/210 (second sheet) (July 1998)*

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/23008

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	LAU, R., et al. "WEBGALAXY: BEYOND POINT AND CLICK - A CONVERSATIONAL INTERFACE TO A BROWSER", NOVEMBER 1997, V. 29, N. 8-13; abstract	1, 14, 19
A, P	COMPUTING CANADA. "BROWSER TRANSLATES HTML INTO SPEECH, LARGE TYPE", 08 JUNE 1998, V. 24, N. 22; pg. 1.	1, 14, 19

09/806,544
5000

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

7

Applicant's or agent's file reference Y0998-392P	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US99/23008	International filing date *(day/month/year)* 01 October 1999 (01.10.1999)	Priority date *(day/month/year)* 02 October 1998 (02.10.1998)
International Patent Classification (IPC) or national classification and IPC IPC(7): G06F 15/16 and US Cl.: 709/201; 709/219		
Applicant INTERNATIONAL BUSINESS MACHINES CORPORATION		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 10 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of report with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
02 May 2000 (02.05.2000)	20 April 2001 (20.04.2001)
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230	Authorized officer Alvin E. Oberley James R. Matthews Telephone No. (703) 305-0286

Form PCT/IPEA/409 (cover sheet)(July 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US99/23008

I. Basis of the report

1. With regard to the **elements** of the international application:*

☐ the international application as originally filed.

☒ the description:
pages 1-56 as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____.

☒ the claims:
pages NONE , as originally filed
pages NONE , as amended (together with any statement) under Article 19
pages NONE , filed with the demand
pages 57-66 , filed with the letter of 26 March 2001.

☒ the drawings:
pages 1-11 , as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____.

☐ the sequence listing part of the description:
pages NONE , as originally filed
pages NONE , filed with the demand
pages NONE , filed with the letter of _____.

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination(under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages NONE

☐ the claims, Nos. NONE

☐ the drawings, sheets/~~fig~~ NONE

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

** Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*
*** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US99/23008

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step r industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims	1-78	YES
	Claims	NONE	NO
Inventive Step (IS)	Claims	NONE	YES
	Claims	1-78	NO
Industrial Applicability (IA)	Claims	1-78	YES
	Claims	NONE	NO

2. CITATIONS AND EXPLANATIONS (Rule 70.7)

Claims 1-78 lack an inventive step under PCT Article 33(3) as being obvious over Krane (US 5,799063 A). Krane teaches a conversational browser (Talk Web browser), comprising: a command and control interface for interpreting a user command (voice response unit, VRU) (col. 6, lines 20-27) and for generating a request to access one of a CML file (Talk Web page) and a CML application (control file / TWC files), wherein CML implements a conversational dialog for interaction with the user (col. 7, lines 1-40); and, a CML processor (speech recognition platform / VRU / index server / audio player) for parsing and interpreting one of a CML file and CML application to render the conversational dialog (col. 3, line 66-col. 4, line 10; col. 5, lines 5-10). It would be obvious that since that web pages have meta-information stored within itself, that a Talk Web page would also have meta-information.

---------- NEW CITATIONS ----------

NONE

WHAT IS CLAIMED IS:

1. A conversational browser, comprising:

a command and control interface for interpreting a user command and for generating a request to access one of a CML (conversational markup language) file and a CML application, wherein CML comprises meta-information implementing a conversational dialog for interaction with the user; and

a CML processor for parsing and interpreting one of a CML file and CML application to to render the conversational dialog.

2. The conversational browser of claim 1, wherein the conversational browser executes on top of a platform that processes input/output (I/O) events under the control of the conversational browser to provide a conversational user interface in accordance with the rendered conversational dialog.

3. The conversational browser of claim 2, wherein the platform is a conversational virtual machine.

4. The conversational browser of claim 1, further comprising a dialog manager for managing and controlling the conversational dialog.

5. The conversational browser of claim 4, wherein the dialog manager allocates conversational engines and conversational data files for rendering the conversational dialog comprising one of the CML file and the CML application and for processing input user commands.

6. The conversational browser of claim 5, wherein the dialog manager is one of controlled and programmed by meta-information comprising one of a CML file and CML application.

7. The conversational browser of claim 5, wherein the conversational engines comprise a speech recognition engine, a speaker recognition engine, a text-to-speech engine, a natural language understanding engine, a natural language generation engine, a dual tone multifrequency engine, a speech compression engine, and a combination thereof.

8. The conversational browser of claim 1, where the input command comprise multi-modal input.

9. The conversational browser of claim 1, wherein CML is implemented using a declarative format.

10. The conversational browser of claim 1, wherein CML encapsulates multi-modal dialog.

11. The conversational browser of claim 9, wherein the declarative format comprises an extensible markup language (XML) format.

12. The conversational browser of claim 1, wherein CML is implemented using a combination of declarative and imperative components

13. The conversational browser of claim 1, wherein the conversational browser implements a "what you hear is what you can say" dialog format.

14. The conversational browser of claim 1, wherein the conversational browser implements a "say what you heard" dialog format.

15. The conversational browser of claim 1, wherein the conversational browser implements a "say what you will hear" dialog format.

16. The conversational browser of claim 1, wherein the conversational browser implements a mixed initiative dialog format.

17. A system for accessing information, comprising:

a content server comprising one of content pages, applications, and a combination thereof, wherein the content pages and applications are implemented using a conversational markup language (CML) to describe a conversational dialog for interaction with a user;

a conversational browser for processing one of a CML page and CML application received from the content server to render its conversational dialog; and

a platform for processing input/output (I/O) events under the control of the conversational browser to provide a conversational user interface in accordance with the rendered conversational dialog.

18. The system of claim 17, wherein the system comprises a IVR (interactive voice response) system, wherein a DTMF application associated with the IVR system is implemented in CML.

19. The system of claim 18, wherein the content server comprises the IVR system, and wherein the IVR system is accessible by the conversational browser over a packet-switched network using a standard network protocol.

20. The system of claim 18, wherein the conversational browser and content server comprise the IVR system, and wherein the IVR system is accessible over a packet switched network using standard network protocol.

21. The system of claim 18, wherein the IVR system comprises a gateway for capturing and compressing speech, and shipping the compressed speech to the content server comprising the IVR system for processing.

22. The system of claim 18, wherein the input modality of the IVR system comprises one of speech, DTMF, and both, and wherein the output modality comprises speech.

23. The system of claim 17, wherein CML is implemented using a declarative format.

24. The system of claim 17, wherein CML encapsulates multi-modal dialog.

25. The system of claim 23, wherein the declarative format comprises an extensible markup language (XML) format.

26. The system of claim 17, wherein CML is implemented using a combination of declarative and imperative components.

27. The system of claim 17, wherein the I/O events are multi-modal.

28. The system of claim 17, wherein the I/O events are speech only.

29. The system of claim 17, wherein the I/O events comprise one of synthesized speech output, playback of audio files, recognition of spoken input, recognition of DTMF (dual tone multifrequency) input, capturing of spoken input, capturing of text input, and a combination thereof.

30. The system of claim 17, wherein the conversational browser one of comprises a CVM (conversational virtual machine) and executes on top of a CVM.

31. The system of claim 17, wherein the conversational browser and platform comprise an embedded architecture that operates in a pervasive computing client device.

32. The system of claim 17, wherein the content server, conversational browser and platform one of execute on a single machine and are distributed over a communications network.

33. The system of claim 17, wherein standard networking protocols are utilized for accessing CML content pages and applications from the content server.

34. The system of claim 33, wherein the standard networking protocols comprise one of TCP/IP (transmission control protocol/Internet protocol), HTTP (hypertext transmission

protocol), WAP (wireless application protocol), VoIP (voice over internet protocol), distributed network protocols, *ad hoc* network protocols, hopping network protocols, and a combination thereof.

35. The system of claim 17, further comprising a transcoder for converting legacy information formats of the content server into CML based on predefined transcoding rules.

36. The system of claim 35, wherein the transcoder interprets backend logic of the content server to generate a corresponding conversational dialog structure.

37. The system of claim 35, wherein the transcoder executes on one of the conversational browser, a conversational proxy server, the content server, and distributed among combination thereof.

38. The system of claim 35, wherein the conversational browser comprises a registration mechanism for registering one of its conversational capabilities, conversational state, and both, with one of the content server, transcoder and both.

39. The system of claim 18, wherein the registration mechanism comprises one of a cookie, a form, procedural protocols, and a combination thereof.

40. The system of claim 38, wherein the transcoder generates one of a custom CML file and CML application based on the conversational capabilities of the conversational browser.

41. The system of claim 17, wherein the CML comprises a plurality of capability-based frames, each providing different dialog levels based on the conversational capabilities of the conversational browser.

42. The system of claim 17, wherein CML comprises an active link that is one of spoken to and hidden from the user.

43. The system of claim 17, wherein CML comprises a link to conversational data files for processing user input.

44. The system of claim 17, wherein CML comprises a link to at least one distributed conversational engine for processing user input.

45. The system of claim 17, wherein CML comprises a link to an audio file for playback to a user.

46. The system of claim 17, wherein CML comprises a confirmation request tag for confirming user input.

47. The system of claim 17, wherein CML comprises TTS (text-to-speech) markup for specifying audio playback of text.

48. The system of claim 17, wherein CML comprises one of scripting language and imperative code for executing conversational applications that direct their own dialog.

49. The system of claim 17, wherein CML comprises a link to one of a plug-in, an applet, a dialog object, and a combination thereof, for executing a conversational task.

50. The system of claim 17, wherein CML comprises one of (1) a top level element that groups other CML elements; (2) an element that specifies output to be spoken to the user (3) a menu element for encapsulating a menu that presents the user with a list of choices, wherein each choice is associated with a target address identifying a CML element to visit if the corresponding choice is selected; (4) a form element for encapsulating a form that allows the user to input at least on item of information and transmit the at least one item of information to a target address; and (5) a combination thereof.

51. The system of claim 50, wherein a target address comprises one of a URL (uniform resource locator), a relative URL, a socket address, and a protocol identifier that identifies a desired protocol for establishing communication.

52. The system of claim 51, wherein the target address is used for accessing one of a local and distributed conversational service.

53. The system of claim 51, wherein the target address is used for accessing one of a local and distributed conversational data file.

54. The system of claim 50, wherein the form comprises input fields, and wherein a grammar is associated with each input field to specify appropriate responses for filling the corresponding input field.

55. The system of claim 54, wherein each choice of the menu is associated with a grammar.

56. The system of claim 55, wherein the menu and form comprise an attribute that specifies when their corresponding grammars are active.

57. The system of claim 50, wherein the conversational browser employs a mixed initiative dialog feature.

58. A method for accessing information, comprising the steps of:

(a) processing an input command with at least one of a plurality of conversational engines;

(b) generating a request based on the processed input command to access a CML (conversational markup language) file from a content server, the CML file comprising meta-information to implement a conversational dialog;

(c) transmitting the request and accessing the requested CML file from a content server using a standard networking protocol; and

(d) processing the meta-information comprising the CML file to render the conversational dialog.

59. The method of claim 58, wherein steps (b), (c) and (d) are executed by a conversational browser.

60. The method of claim 59, wherein the conversational browser executes on top of an operating platform of a pervasive computing device.

61. The method of claim 58, wherein steps (a) and (d) are one of executed locally using a conversational engine and conversational arguments, executed remotely using distributed conversational engines and conversational arguments, and a combination thereof.

62. The method of claim 59, further comprising the step of:

registering one of conversational capabilities, conversational state, and both of the conversational browser with the content server.

63. The method of claim 62, further comprising the step of customizing the CML file based on the conversational capabilities of the conversational browser..

64. The method of claim 58, further comprising the step of transcoding legacy content of the content server into CML based on predefined transcoding rules.

65. The method of claim 64, wherein the step of transcoding is performed by one of a conversational browser, a transcoding proxy associated with a content server from which the legacy content is accessed, and a combination thereof.

66. The method of claim 64, further comprising the step of processing backend logic of the content server to generate a corresponding conversational dialog structure.

67. The method of claim 58, wherein step (d) comprises the step of playing back an audio file, generating synthesized speech output, and a combination thereof.

68. The method of claim 58, wherein CML is implemented using a declarative format.

69. The method of claim 68, wherein the declarative format is based on XML (extensible markup language).

70. The method of claim 58, wherein CML comprises multi-modal dialog.

71. The method of claim 58, wherein CML comprises declarative and procedural components.

72. The method of claim 58, wherein CML comprises one of (1) a top level element that groups other CML elements; (2) an element that specifies output to be spoken to the user (3) a menu element for encapsulating a menu that presents the user with a list of choices, wherein each choice is associated with a target address identifying a CML element to visit if the corresponding choice is selected; (4) a form element for encapsulating a form that allows the user to input at least on item of information and transmit the at least one item of information to a target address; and (5) a combination thereof.

73. The method of claim 72, wherein a target address comprises one of a URL (uniform resource locator), a relative URL, a socket address, and a protocol identifier that identifies a desired protocol for establishing communication.

74. The method of claim 73, wherein step (d) comprises the step of accessing one of a local and distributed conversational service associated with the target address.

75. The system of claim 72, wherein step (d) comprises the steps of:

audibly outputting an introductory message of a form to a user, if a form element is visited;

activating a grammar for each input field of the form, wherein the grammar specifies at least one appropriate value for the corresponding input field; and

filling a field if the user speaks an appropriate response for the field.

76. The method of claim 75, further comprising the steps of:

audibly outputting an introductory message of a menu to a user, if a menu element is visited;

audibly outputting prompt text of choice elements associated with the menu;

activating a grammar for each choice element, wherein the grammar specifies a response for selecting the given choice element; and

selecting a choice element if the spoken response of the user matches the grammar associated with the choice element.

77. The method of claim 76, further comprising the step of activating the grammars of the menu and form for a predefined duration based on an attribute value specified by the menu and form elements.

78. The method of claim 72, further comprising the step of employing a mixed initiative dialog feature for one of filling form input fields and selecting menu choices.